



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,508	01/23/2004	Christian Velez	FRG-15267	7237

40854 7590 01/18/2006

RANKIN, HILL, PORTER & CLARK LLP
4080 ERIE STREET
WILLOUGHBY, OH 44094-7836

EXAMINER

LOUIE, WAI SING

ART UNIT	PAPER NUMBER
----------	--------------

2814

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No. 10/763,508	Applicant(s) VELEZ ET AL.	
	Examiner Wai-Sing Louie	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-31 and 34 is/are rejected.
- 7) ☒ Claim(s) 32 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/14/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 33 recites the limitation "the disc-shaped body" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-29, 31, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fouquet (US 5,252,839) in view of Shigeno (US 5,227,646).

With regard to claims 21, 31, Fouquet discloses a superluminescent light-emitting diode with reverse biased absorber (col. 4, line 39 to col. 9, line 68 and fig. 2) comprising:

- a superluminescent light-emitting diode 30 (col. 4, lines 39-41 and fig. 2), the superluminescent light-emitting diode 30 comprising a semiconductor heterostructure 60 forming a pn junction 56 (col. 6, lines 10-18 and fig. 2) 40-42 and a waveguide defining an optical beam path (col. 5, line 66 to col. 6, line 3 and fig. 2);

- A heterostructure including a gain region 50 and an absorber region 52 in series with the gain region 50 in the optical beam path (col. 6, lines 7-10);
- A first contact for applying a voltage to the pn junction in its forward direction in the gain region 50 (fig. 5), so as to produce light emission from the gain region 50 and along the optical beam path (col. 6, lines 25-28);
- A second contact contacting the pn junction in the absorber region 52 (fig. 5) and operable to remove charge carriers generated by absorption in the absorber region 52 at zero bias (col. 6, lines 12-18 and col. 8, line 28).
- Fouquet does not disclose that the diode comprising a housing carrying the superluminescent light-emitting diode, where the housing comprising a symmetry axis that the optical beam path is parallel to the symmetry axis. However, Shigeno discloses an optical semiconductor device, where LED chip 1 is mounted in a housing 10 (Shigeno col. 2, lines 39-40 and fig. 1), where the housing comprising a symmetry axis (Shigeno fig. 1 and 3) that the optical beam path 15 of the laser chip 1 is parallel to the symmetry axis (Shigeno fig. 1). Shigeno teaches the optical beam axis and the symmetry axis of the housing are arranged to a high degree of assembling workability, increased operation speed, and small in size (Shigeno col. 1, lines 56-57). Therefore, it would have been obvious to one of ordinary skill in the art to modify Fouquet's device with the teaching of Shigeno to place the SLED apparatus in a housing having a symmetry axis parallel to the optical beam path in order to make the layout to a high degree of assembling workability, increased operation speed, and small in size.

With regard to claim 22, Fouquet discloses the second contact includes a wire contact between a p-layer 56 and an n-layer 44 (fig. 2a and 2b).

With regard to claim 23, Fouquet discloses the PN junction comprises an n-doped side 42 and a p-doped side 40 (fig. 2a). Fouquet modified by Shigeno discloses the n-doped side 42 and the p-doped side 40 is connected, by the second contact, to a metallic surface 11 outside the heterostructure (Shigeno fig. 1).

With regard to claim 24, Fouquet discloses the waveguide structure comprises two end facets 60 and 64 limiting the waveguide structure in a longitudinal direction parallel to the optical beam path, the end facets 60 and 64 being perpendicular to the longitudinal direction (col. 6, lines 24-48 and fig. 2).

With regard to claim 25, Fouquet discloses the pn junction in the gain region 50 and in the absorber region 52 is made of bulk semiconductor material (col. 9, line 10) comprising a p-doped component 40 and n-doped component 42 (col. 5, lines 67-68). Fouquet discloses the wavelength emitted is 1.3 and 1.55 microns and, thus, the thickness of the layer sized by the formula $\lambda/4n$ would exceed 10 nm (col. 5, lines 58-59).

With regard to claim 26, Fouquet discloses the semiconductor heterostructure in the gain region includes a multiple quantum well (MQW) structure 32 (col. 5, lines 55-62) where the pn junction is formed in the MQW structure (fig. 2).

With regard to claims 27-28, Fouquet discloses waveguide layers 40 and 42 (col. 5, lines 67-68) and the waveguide is index guided and gain guided (col. 3, lines 44-50).

With regard to claim 29, Fouquet discloses the semiconductor heterostructure comprises:

- A first n-doped cladding layer 42 being in electrical contact to a first metal electrode 54 and a second p-doped cladding layer 40 being in electrical contact to a second metal electrode 58 (fig. 2);
- A multiple quantum well (MQW) structure 32 (col. 5, lines 55-62) where the pn junction is formed in the MQW structure (fig. 2);
- The first and second electrodes 54 and 58 being interrupted between the gain region 50 and absorber region 52 (fig. 2).

With regard to claim 34, Fouquet discloses the SLED comprising monitoring means for monitoring a photocurrent (75 mA) generated by radiation emitted in the active region and absorbed in the unbiased pn junction, producing a monitoring signal (75 to 85 dB) being measure of the light emitted in the gain region 50 (col. 8, lines 14-35).

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fouquet (US 5,252,839) in view of Shigeno (US 5,227,646) and the admitted prior art.

With regard to claim 30, Fouquet modified by Shigeno does not disclose the housing is a TO-can. However, the admitted prior art discloses the TO-can casing is standard casing known in the art for laser diode (specification page 4, lines 6-12). The admitted prior art teaches the TO-can housing allows reduction in cost to house the SLED device (page 4, lines 11-12). Therefore, it would have been obvious at the time the invention was made to modify Fouquet's device with the teaching of Shigeno and the admitted prior art to use the TO-can housing in order to reduce cost for the housing.

Allowable Subject Matter

Claims 32-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose or suggest either in singularly or in combination the following limitations and other elements in the claims. References Fouquet, Shigeno, and the admitted prior art do not disclose:

- A disk-shaped body with two parallel facets.
- The beam path is concentric with the disc-shaped body.

Therefore, the above references do not disclose the claimed invention of present application and claims 32-33 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments with respect to claim 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Wai-Sing Louie
Patent Examiner

Wsl
January 13, 2006.